23. (New) The gas discharge detector of Claim 22 wherein the gas discharge tube is no more than 10 millimeters in length.

24. (New) The gas discharge detector of Claim 23 wherein the gas discharge tube has a diameter on the order of 1 mm.

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25. (New) The gas discharge detector of Claim 21 further including a heater comprising a radio frequency energy source powering the sample gas in the cooling zone, such energy source being located outside the enclosed passageway.

26. (New) The gas discharge detector of Claim 21 further including a heater comprising a microwave energy source powering the sample gas in the cooling zone, such energy source being located outside the enclosed passageway.

REMARKS

This Response amends the claims in the application. Claims 6 and 9-20 are cancelled. Claims 21-26 are added. Independent Claim 1 and dependent Claim 2 has been amended. Claims 1-5, 7, 8 and 21-26 are pending in the application. Claims 1 and 21 are independent.

Enclosed is a proposed correction to the Figure 2 as requested by the Examiner. Reference Numeral 41' has been corrected in red to point to an o- ring. A letter to the Official Draftsmen is enclosed herewith.

It is submitted that all of the claims in the application are now allowable.

Unlike the cited references, independent Claims 1 and 21 set forth discharge detector comprising a gas discharge tube that is cooled in a zone by contained air moving

through an enclosed passageway in contact with the outer surface of the tube. More specifically, the detector comprises a gas discharge tube for carrying a gas sample from the detector and an enclosed passageway through which contained cooling gas, such as air, is moved for cooling the discharge tube. The contained cooling air comes in contact with the outer surface of the gas discharge tube to form a cooling zone along such tube. A heater is located to impart heat to the gas sample in discharge tube in the cooling zone established by contained cooling gas. The cited references neither teach nor suggest the applicant's detector as set forth in the claims.

In contrast to the applicant's detector, the Meyer reference (U.S. Patent No. 4,482,246) discloses a plasma torch where cooling of a discharge tube is established by released gas or air. Meyer discloses a three-tube discharge arrangement, preferably concentric tubes (col. 3, lines 37-40). This arrangement is plainly seen in Figure 2. The three tubes are a containment tube 1, intermediate tube 2 and a central of nebulizer tube 3. The discharge arrangement of the plasma torch has coolant supplied in an outer annulus 9 between tubes 1 and 2 and has plasma gas supplied in an inner annulus 10 between central tube 3 and intermediate tube 2 (column 3, lines 54-57). High frequency energy heats the plasma 18 after the coolant exits or is released from the outer annulus 9. This is in stark contrast to applicant's claimed detector, which cools the discharge tube in the heating zone with contained cooling gas – not released coolant.

Like Meyer, the Okamoto et al. reference (U.S. Patent No. 5,086,255) discloses a plasma torch where cooling of a discharge tube by released air in the heating zone. Okamoto discloses a plasma torch having a discharge tube 70 and a sample inlet pipe 71 extending longitudinally therein. Okamoto also discloses an inlet pipe or tube 51

surrounding the discharge tube 70. The tubes 70, 71, and 51 are concentric and carry plasma gas 80, liquid sample 90, and cooling gas 80 respectively. The tubes 71 and 51 appear to terminate together and short of the discharge tube 70. So the cooling effect in Okamoto on the discharge tube 70 of released coolant gas 80 after it exits the discharge end of the tube 51. This is plainly seen in Figure 1 that shows helical coil 30 at the high-temperature plasma 100 and diffused plasma 110 after release of the coolant gas from the termination of inlet tube 51. Consequently, like Meyer, Okamoto is in stark contrast to applicant's claimed detector.

The dependent claims in the application present patentable aspects of the independent Claims 1 and 21. Therefore, it is believed these dependent claims are also allowable of the cited art.

In view of the foregoing, it is believed that this Response overcomes all of the rejection and that the claims in the application clearly and patentably distinguish over all of the cited references, either alone or in combination. Therefore, the Examiner's reconsideration and favorable action are hereby respectfully requested.

Respectfully submitted,

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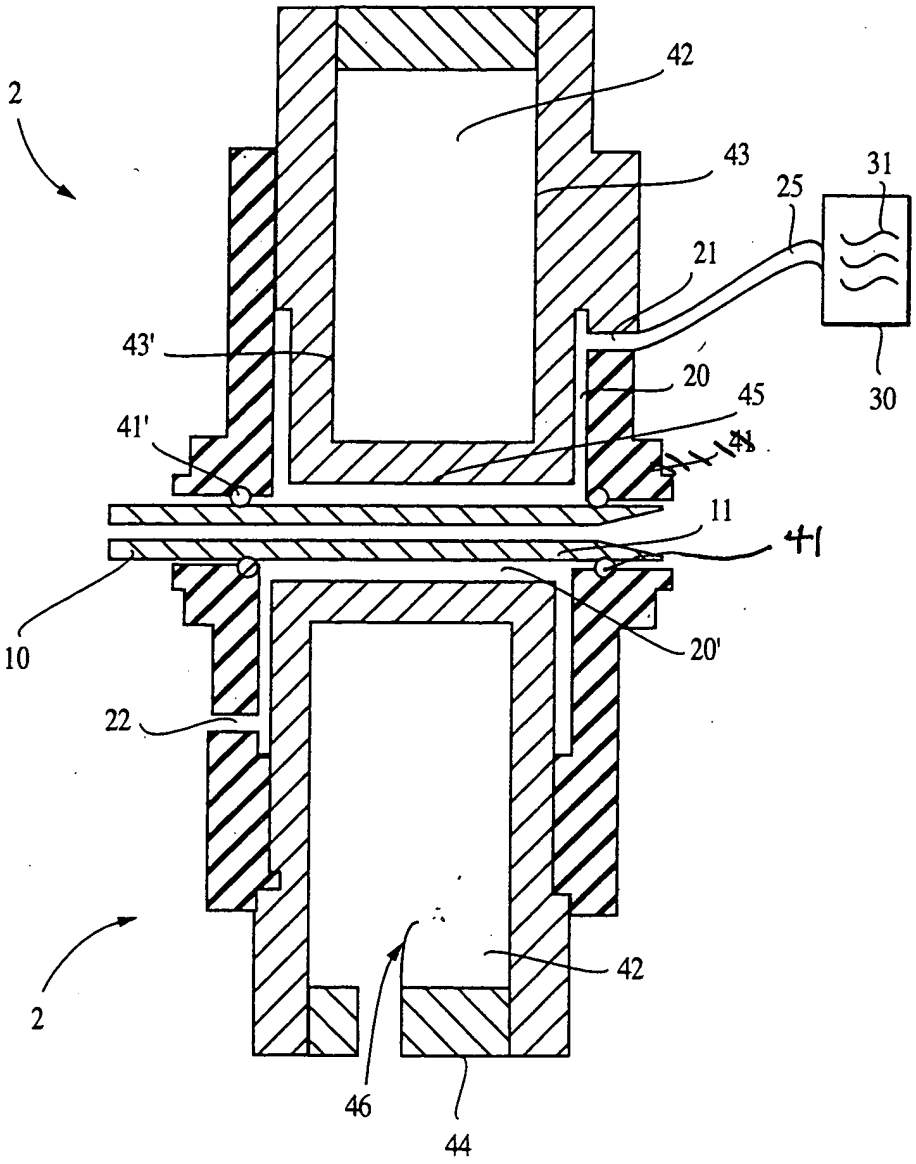

FIG. 2